

Warmup

Solve each system. Check your answers.

$$4x + 2y = 7$$

$$y = 5x$$

$$x + 2y = 10$$

$$x + y = 6$$

$$4x + 2y = 7$$

$$\textcircled{y = 5x}$$

Substitution

$$\begin{array}{r} 4x + 2y = 7 \\ -4x \quad -4x \end{array} \rightarrow \frac{2y}{2} = \frac{7-4x}{2} \rightarrow y = 3.5 - 2x$$

$$\begin{array}{r} 5x = 3.5 - 2x \\ +2x \end{array} \rightarrow \frac{7x}{7} = \frac{3.5}{7}$$

$$\begin{array}{r} 4(.5) + 2y = 7 \\ \underline{\quad 2} \end{array} \rightarrow 2y = 5$$

$$x = .5$$

$$\frac{2y}{2} = \frac{5}{2} \rightarrow y = 2.5$$

$$x + 2y = 10$$

$$x + y = 6$$

$$\begin{array}{r} x + 2y = 10 \\ -x \quad -x \\ \hline 2y = 10 - x \\ \frac{2}{2} \quad \frac{2}{2} \\ y = 5 - .5x \end{array}$$

$$\begin{array}{r} x + y = 6 \\ -x \quad -x \\ \hline y = 6 - x \end{array}$$

$$\begin{array}{r} 2 + y = 6 \\ -2 \quad -2 \\ \hline y = 4 \end{array}$$

$$\begin{array}{r} 6 - x = 5 - .5x \\ +x \quad +x \\ \hline 6 = 5 + .5x \\ -5 \quad -5 \\ \hline 1 = .5x \\ \frac{1}{.5} \quad \frac{.5}{.5} \\ 2 = x \\ 4 = y \end{array}$$

# For solving Systems

1  
1

Help!

2  
1

If you sort  
of get<sup>it</sup> when you  
see it, but  
have time reproducing  
it yourself

3  
1

totally get it.

a)  $y = 3x$  and  $y = 2x + 5$

## NOTES

Substitution (easy to do ①)

- ① Solve one equation for a "strategic" variable
- ② Substitute ① into the other equation.
- ③ Solve for other variable that is left.
- ④ Plug in ③ into an equation you started with. Solve for the variable

① Already done

②  $3x = 2x + 5$

③  $x = 5$  ←

④  $y = 3(5) = 15$   
 $(5, 15)$

$$b) x = -12 \quad y = -43$$

e)  $4x - 3y = -2$  and  $2y + 3 = 3x$   
 $-3x + 2y = -3$   
 $\frac{3y}{-3} = \frac{-2-4x}{-3}$   
 $y = \frac{2}{3} + \frac{4}{3}x$

$-3x + 2y + 3 = 0$   
 $-3 = -3$

$-3x + 2y = -3$

### Elimination

- ① Multiply your equations so that the coefficient for x or y are the same.
- ② add / subtract the equations  $\rightarrow$  eliminate a variable.
- ③ solve for the other variable
- ④ plug in ③ in one of the starting equations

①  $3[4x - 3y = -2]$   
 $12x - 9y = -6$

②  $-12x + 8y = -12$

③  $-y = -18$   
 $y = 18$

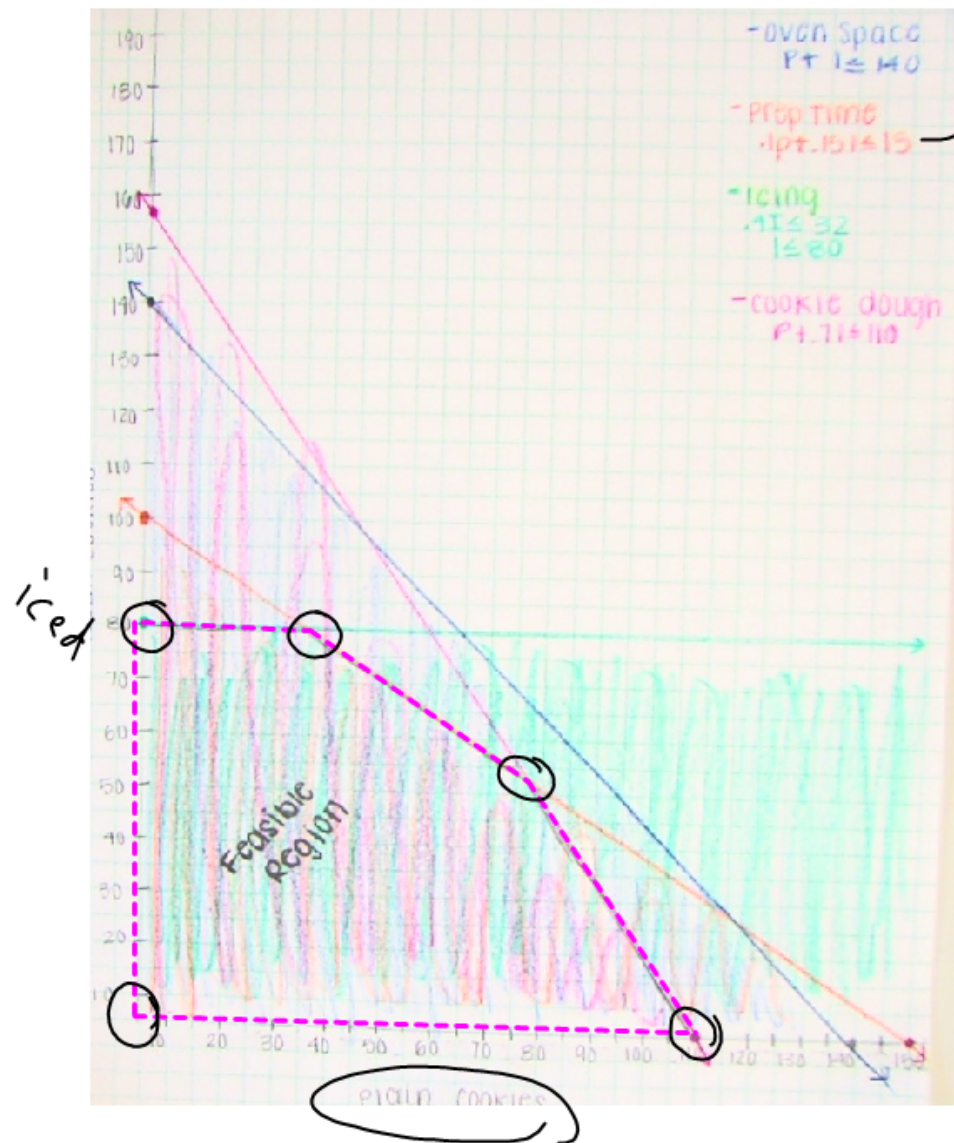
④  $4x - 3(18) = -2$   
 $4x - 54 = -2$   
 $4x = 52$   
 $x = 13$

check  
 $-3(13) + 2(18) = -3$   
 $-39 + 36 = -3$

## Cookies Assessment (due Tuesday):

- 1) Answer the Woo's dilemma, i.e., how many of each kind of cookie gives them the most profit? Include how much of each constraint is used.
- 2) Provide a convincing explanation that your answer provides the greatest profit (HINT: *Graphs & Algebra* are convincing arguments).
- 3) Add charts, graphs, equations, constraints, diagrams, etc. to your writeup.





$$.1p + .15i = 15$$

(80)

1.50 - plain

2.00 - iced

$$1.50p + 2.00i = ?$$

$$10d + 5n + 6 = \underbrace{\quad}_{?d} + \underbrace{\quad}_{?n} + \underbrace{60}_{\substack{\text{perm.} \rightarrow \text{dines} \\ \downarrow}}$$

~~\$~~